COURSE MODULE OF THE SUBJECT TAUGHT FOR THE SESSION 2025 (EVEN SEM)

Course Syllabus with CO's

Faculty Name : Mrs Vanitha G Naik	**Academic Year:2025-26**
Department : Computer Science & Engineering(AI and ML)	

Course Code	Course Title	Core/Elective	Prerequisite	Contact Hours			Total Hrs/ Sessions
				L	T	P	
BCSL404	Analysis & Design of Algorithms Lab	Core	C Programming Concepts	-	-	2	28

Course Objective	**Course Learning Objectives:** This laboratory course enables students to get practical experience in design, develop, implement, analyze and evaluation/testing of **CLO1**: To design and implement various algorithms in C/C++programming using suitable development tools to address different computational challenges. **CLO2:** To apply diverse design strategies for effective problem-solving. **CLO3:** To Measure and compare the performance of different algorithms to determine their efficiency and suitability for specific tasks.

Topics Covered as per Syllabus

1. Design and implement a C/C++ Program to find the minimum cost spanning tree of a given connected undirected graph using Kruskal's algorithm

2. Design and implement a C/C++ Program to find the minimum cost spanning tree of a given connected undirected graph using Prim's algorithm.

3. a. Design and implement a C/C++ Program to solve the All-Pairs Shortest Paths problem using Floyd's algorithm.
   b. Design and implement a C/C++ Program to find the transitive closure using Warshall's algorithm.

4. Design and implement C/C++ Program to find shortest paths from a given vertex in a weighted connected graph to other vertices using Dijkstra's algorithm.

5. Design and implement C/C++ Program to obtain the Topological ordering of vertices in a given digraph.

6. Design and implement C/C++ Program to solve 0/1 Knapsack problem using Dynamic Programming method.

7. Design and implement C/C++ Program to solve discrete Knapsack and continuous Knapsack problems using greedy approximation method.

8. Design and implement C/C++ Program to find a subset of a given set S={sl,s2,.........,sn} of n Positive integers whose sum is equal to a given positive integer d.

9. Design and implement C/C++ Program to sort a given set of n integer elements usingSelection Sort method and compute its time complexity. Run the program for varied values of n> 5000 and record the time taken to sort. Plot a graph of the time taken versus n. The elements can be read from a file or can be generated using the random number generator.

10. Design and implement C/C++Program to sort a given set of n integer elements using QuickSort method and compute its time complexity. Run the program for varied values of n> 5000 and Record the time taken to sort. Plot a graph of the time taken versus n. The elements can be read from a file or can be generated using the random number generator.

11. Design and implement C/C++ Program to sort a given set of n integer elements using Merge Sort method and compute its time complexity. Run the program for varied values of n > 5000, and record the time taken to sort. Plot a graph of the time taken versus n.The elements can be read from a file or can be generated using the random number generator.
12. Design and implement C/C++ Program for N Queen's problem using Backtracking.

Laboratory Outcome	**After studying this course, students will be able to** **CO1**: Develop programs to solve computational problems using suitable algorithm design strategy. **CO2**: Compare algorithm design strategies by developing equivalent programs and observing running times for analysis (Empirical). **CO3**: Make use of suitable integrated development tools to develop programs **CO4**.Choose appropriate algorithm design techniques to develop solution to the computational and complex problems. **CO5**:Demonstrate and present the development of program, its execution and running time(s) and record the results/inferences.

Conduct of Practical Examination:

The weight age of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation(CIE):

CIE marks for the practical course are 50 Marks.The split-up of CIE marks for record/journal and test are in the ratio 60:40.

- Each experiment is to be evaluated for conduction with an observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments are designed by the faculty who is handling the laboratory session and are made known to students at the beginning of the practical session.
- Record should contain all the specified experiments in the syllabus and each experiment write- up will be evaluated for 10 marks.
- Total marks scored by the students are scaled down to 30 marks (60% of maximum marks).
- Weight age to be given for neatness and submission of record/write-up on time.
- Department shall conduct a test of 100 marks after the completion of all the experiments listed in the syllabus.
- In a test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weight age of 60% and the rest 40% for viva-voce.

- The suitable rubrics can be designed to evaluate each student’s performance and learning ability.
- The marks scored shall be scaled down to 20 marks (40% of the maximum marks).

The Sum of scaled-down marks scored in the report write-up/journal and marks of a test is the total CIE marks scored by the student.

The Correlation of Course Outcomes (CO’s) and Program Outcomes(PO’s)

Subject Code:	BCSL404		Title : Analysis & Design of Algorithms Lab					Faculty Name: Vanitha G Naik				
List of Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1	3	2	1	2	-	-	-	-	-	-	-	2
CO-2	3	2	1	2	-	-	-	-	-	-	-	2
CO-3	3	2	1	2	-	-	-	-	-	-	-	2
CO-4	3	2	1	2	-	-	-	-	-	-	-	2
CO-5	3	2	1	2								2
Total	**15**	**10**	**5**	10	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**10**

Note:3=Strong Contribution 2=Average Contribution 1=Weak Contribution-=No Contribution

The Correlation of Course Outcomes (CO’s)and Program Specific Outcomes(PSO’s)

Subject Code:	BCSL404	TITLE: Analysis & Design of Algorithms Lab	Faculty Name:Mrs Vanitha G Naik
List of Course Outcomes	Program Specific Outcomes		
	PSO1	PSO2	Total
CO-1	3	-	3
CO-2	3	-	3
CO-3	3	-	3
CO-4	3	-	3
CO-5	3	-	3